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In the Nation's Capital

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WILL THE ANTI-MONOPOLY program of the New Deal affect the telephone industry? . . . The anti-bigness theory . . . Bell System often has been held up as an example of big but honest enterprise. . . . U. S. Supreme Court's ruling on fixing of valuations in utility rate cases is rather ambiguous

THE RECENT speeches of Assistant Attorney General Jackson and Secretary of Interior Ickes blaming the new "recession" on the monopolistic practices of big business are only one of a number of indications that the New Deal, in the event that its present stand-offish and very experimental honeymoon with the business interests comes to grief, may revert to an era of good old-fashioned trust-busting such as will cheer the shade of the departed Teddy Roosevelt but leave the spirits of Taft and Coolidge glumly brooding in the Valhalla of departed chief executives.

In this new offensive against monopoly, the administration will receive support from a number of congressional members — such as Senator Borah of Idaho—who have opposed its planned economy program (*a la* NRA and AAA), but it will also risk new opposition from the champions of planned economy (sometimes critically nicknamed "the school of scarcity").

Perhaps of more interest to the Independent telephone industry is the possibility that if a new anti-monopoly program is actively and vigorously pursued by the New Deal all up and down the line of American industry, it may open up again the old question of Bell control which has been kept under the seal of a virtual status quo since the Kingsbury commitment.

THE NEW Deal, as already hinted, has scarcely followed a consistent course with respect to industrial monopoly. Editorial writers all over the land were quick to point out that the NRA was the greatest single step towards business monopoly that any government has ever taken. But it is typical of the erratic course, which the New Deal has followed, that what was good yesterday is bad today, and the same things General Johnson pleaded with business to do in 1934 become criminal conspiracy in 1937.

The reason for this somewhat crazy vacillation of policy is the conflict of thought within the New Deal circles. And it is not the usual and simple difference between the Right and Left. There is no real Right wing within the real inner circle of the New Deal. It is all pretty much Left wing but these very Left-wing advisers are split into the economic planners and the anti-bigness advocates.

BACK IN '33 and '34 when the Blue Eagle was flying high, it was the planners who had the upper hand and the President's ear. That policy still persists in some quarters. A good example of it is the Guffy-Vinson Act, which virtually forces the bituminous coal industry into a trust combination.

But the death of the Blue Eagle and the generally sour results that have come from New Deal experiments in planning have changed the President's mind on the subject. Now he is thinking about back-tracking—breaking up business into little pieces. Note the statement that he is just thinking about it.

The speeches of Jackson and Ickes are mere trial balloons to test reaction. Note also the relatively temperate tone of the President's own

message to the opening of the regular session of Congress. Mr. Roosevelt is moving these days with somewhat more deliberation than is his custom.

THE ANTI-BIGNESS advocates, who seem to be the administration favorites of the moment, trace their movement back beyond even trust-busting Teddy Roosevelt. It was Justice Brandeis who, as a vigorous young Massachusetts lawyer, rationalized and organized the anti-bigness theory from a mere suspicion of big business to a defensible doctrine of political policy. Professor Frankfurter of Harvard University is the present high priest of the movement; and it was from him, probably, that President Roosevelt became innoculated with the germ.

It is said that Harvard University hatches new disciples of this economic creed by the hundreds a year, but other institutions of higher learning are doing their share for the cause. Two professors at Columbia University—James C. Bonbright and Gardiner C. Means — wrote a book on holding companies back in 1932 which has become just about the bible of the anti-bigness school of thought.

Reduced to the form of a scholastic syllogism, the logic of the anti-bigness movement runs something like this:

1. A government cannot regulate, in the public interest, forces which become bigger and more powerful than the government itself.
2. Unrestricted modern industrial corporations tend to become bigger and more powerful than the government itself.
3. Therefore, the government cannot regulate, in the public interest, unrestricted modern industrial corporations.

The implied *sequitur*, to continue the logician's approach, is that modern corporations should be restricted; *i. e.*, broken up into little pieces so that the government can once more regulate them in the public interest.

THE SLICKEST thing about the foregoing proposition is that it draws popular opposition away from its vulnerable point. Many people will immediately question the soundness of the minor premise (No. 2) but accept without question the major premise (No. 1). As a matter of fact, it can be certainly demonstrated that modern industrial corporations do tend, in combination at least, to become bigger and more powerful than the government if their natural economic growth is unchecked. Bonbright and Means proved this conclusively in their 1932 volume.

Of course, no one industry—such as the telephone industry, in which the highly-organized Bell System is so prominent—is really bigger or more powerful than the Federal government. But suppose all utility industries, for example, were organized into separate 100 per cent monopolies—allowed to get that way without hindrance. Next, throw in the transportation carriers and assume that all of these industries decided to act in combination with one another—a corporate front, so to speak.

Add up the result and you would find that such a combination would have more invested capital, employ more people, buy more goods, etc., than the Federal government, excluding the Army and the Navy. And if the agricultural groups were so combined, we would not have to exclude the Army and Navy.

This is the bugaboo which, once demonstrated, frightens many conscientious citizens into the state of mind that something must be done to prevent such a terrible thing from ever coming to pass. And when the disciples of the anti-bigness school stand like the old Roman Senator Cato and chant over and over that bigness must be destroyed, they begin to listen. "Unless government regulates business," say the disciples, "business will regulate government and the people will be enslaved!"

This or something along the same line is the central theme of the recent Jackson and Ickes speeches, although just what Mr. Jackson—who is supposed to head the government's anti-trust enforcement — has ever done about the problem except call names is difficult to discover.

BUT TO GO back to our syllogism: Does it really follow that the government cannot effectively regulate big business? Is big business inherently bad? Is there something about size alone which makes men who are honest as individuals public enemies when acting in association?

Well, a great many people don't think so. Compare the business ethics, the wage scales, the quality of service, and so forth, of big business with little business and you will see that it doesn't always follow that corporate power begets abuse. As a matter of fact, the Bell System has often been held up as an example of big but honest enterprise.

The government, both state and Federal, has regulated this industry and is regulating it quite effectively and in the public interest. The growth, quality, use, and cost of telephone service in America compared with governmentally-operated systems in foreign countries are almost prima facie evidence that the American way is better. Independent competition is entitled to more credit for this than is usually given.

Of course, when you talk about telephone service or any utility service, it is necessary to distinguish between mere territorial monopoly and corporate monopoly. It is obvious that territorial monopoly in utility service is absolutely necessary in the public interest. One need only recall the old competitive days when subscribers in large cities had to have two telephones in the house to insure adequate service, in order to concede that point.

But granting the propriety of territorial monopoly, is it necessary that operating companies in separate regions should be corporately controlled by the same parent? The Bell men would say "yes" without hesitation. There are some clear reasons for this position: the necessity for absolute coordination in controlling long-distance traffic and the economic benefits of strongly-centralized financing, purchasing and management—to mention just a few.

Some advisers of the administration, perhaps, might not agree with all this. Consider what the anti-bigness wing succeeded in putting over in the Holding Company Act, which would break up corporate control of gas and electric utilities into smaller systems which are "geographically and economically integrated." They might even concede that it was necessary, during the pioneering days, for the Bell to grasp absolute control of as many units of the industry as possible; but now that the standards of service have been established, the same thing can be handled by operating agreements, such as Bell has with the Independent companies.

Of course, the known main objectives of the latest anti-bigness drive in Washington are the steel and automobile industries, especially concerns which are closely controlled by single individuals or family groups. This form of "economic autocracy" is first on the list proscribed by the trust-busters of the New Deal.

THE MECHANICS of the anti-bigness movement are various, ranging from discouraging taxes on chain stores to outright anti-trust

proceedings and enactments similar to the Holding Company Act. It is important, however, to remember that many of the anti-bigness leaders are pretty important and intelligent people. They are not just a bunch of rattle-brained reformers who are bent on returning us to a peasant economy under which the bulk of business would be conducted by smaller companies, partnerships or proprietors, and service standards would degenerate to the level of the old village general store.

Some of them are, perhaps, a little lightweight between the ears, but you just can't laugh off folks like Justice Brandeis, even if it is simple enough to dismiss the name-callers, such as Mr. Jackson. The intelligent anti-bigness leaders realize, and willingly concede, that a certain amount of growth and coordination is not only inescapable under modern commercial conditions, but essential for the consumer interest.

But they argue well for the proposition that there is no point (varying according to each case) in corporate growth where efficiency and economy no longer keep pace. The monopoly keeps growing but in the absence of competition, service standards begin to slip. The vicious circle is completed, they say, when the consuming public finds it can do nothing about it. The monopoly has gobbled up all of its economic checks.

Well, it's an interesting thesis but it has never been proven to everyone's satisfaction. It seems more likely that the very national economic forces that promulgate corporate growth in order to gain more profits would slow up and stop when further growth begins to dissipate profits through a diminution in economic operation. The presence or absence of outside competition has much effect, of course. But a sales chart should be just as powerful an argument to a monopolistic executive as it is to the management of competitive enterprise.

PERHAPS the forthcoming report of the FCC on its special Bell investigation may throw some light on whether the anti-bigness New Dealers have any definite designs in the direction of the telephone industry. Chairman McNinch, while possibly not collaborating on this report, has ample powers of editing as far as general dictation of policy is concerned. And everyone knows that he is close to the White House and very sensitive to the latest ideas he hears discussed there.

Just what could be done about Bell along the lines of decentralization is too vast a problem to talk about offhand or in sketchy fashion. The obvious idea of making the parent turn back all the stock to her children and continuing only as the operator of the long-distance section is probably too simple to be practical.

A less abrupt and drastic method might be in the nature of the device formed by the District of Columbia commission (recently discussed in this department) of requiring open competitive bidding on all new security issues by Bell subsidiaries. This would be a long drawn-out process, but eventually it might result in getting Bell subsidiary stock out into the open market.

Of course, it must be understood that all this talk about breaking up the Bell is just speculation made in the light of the recent tone of administration policies toward big business generally. But for the Independent telephone industry it should be a matter of careful concern. Great big things may be ahead for the Independent industry—bigger than many of the Independent executives have ever dreamed of. It may all depend on the next turn of the Washington wheel.

COMING CONVENTIONS

Minnesota Telephone Association, Radisson Hotel, Minneapolis, January 25, 26 and 27.

Texas Telephone Association, Adolphus Hotel, Dallas, March 23, 24 and 25.

Oklahoma Telephone Association, Huckins Hotel, Oklahoma City, March 29 and 30.

Missouri Telephone Association, Hotel Muehlebach, Kansas City, April 4 and 5.

Iowa Independent Telephone Association, Fort Des Moines Hotel, Des Moines, April 12, 13 and 14.

Nebraska Telephone Association, Hotel Paxton, Omaha, April 19 and 20.

Kansas Telephone Association, Topeka Hotel, Topeka, April 27 and 28.

Ohio Independent Telephone Association, Deshler-Wallick Hotel, Columbus, May 3, 4 and 5.

Indiana Telephone Association, Claypool Hotel, Indianapolis, May 11 and 12.

Pennsylvania State Telephone & Traffic Association, Yorktowne Hotel, York, June 2, 3 and 4.

New York State Telephone Association, Seneca Hotel, Rochester, June 7, 8 and 9.

THE WAY seems to have been cleared for any regulatory commission to fix valuations in utility rate cases by giving primary consideration to original cost, although apparently it will still be necessary for the commission to indicate that it has considered reproduction cost and other elements.

In deciding the Pacific Gas & Electric Co. case, however, the U. S. Supreme Court's opinion, written by Chief Justice Hughes, is rather ambiguous and doubtless will be subjected to varying interpretations. The case was remanded to the lower court with instructions to determine whether the California Railroad Commission's order would result in confiscation—a point upon which the lower court neglected to rule.

That the majority opinion will, perhaps, generally be viewed as tacitly approving the original cost theory of valuation is indicated by the dissent of Justice Butler, in which Justice McReynolds concurred, holding that the court had repudiated its previous decisions.

The majority, however, carefully steered clear of a positive statement on this point, thereby dashing the hopes of the Federal Communications Commission and the Federal Power Commission which had asked for a definite reversal of the 40-year old rule.

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Ohio Independents Protest Utilities' Tax

Should the Ohio general assembly decide to reenact an excise tax on public utilities of 1 per cent or more for the purpose of providing funds for poor relief in the state, it will be over vigorous protests of the Independent telephone interests of the state.

Officers of the Ohio Independent Telephone Association and representatives of member companies of the association appeared before legislative committees to urge that some other source of revenue be found for providing relief funds.

Recognizing that relief would have to be provided in some manner, the telephone representatives pointed out that they should be relieved of further burden in view of the fact that the tax load of telephone companies in the state in 1938 will be still higher than they were in 1937. It was contended that such companies already are contributing more than their fair share of relief, under existing laws, than most forms of business and industry.

Year of Progress Abroad In Communications

GENERAL information obtained through contacts and operations of companies throughout the world belonging to the International Telephone & Telegraph Group, indicates that in science and art of electrical communication during the past years, and especially in 1937, progress has perhaps been greater than in any other field of human endeavor—this despite the fact that applications of electrical communication have been increasing for the past century, not only in extent but in variety of services.

Thus developments of the year abroad have placed broad band transmission on a firm basis, both in the land and the submarine transmission fields; applications of greatly-increased frequencies can now be definitely visualized; higher power, ultra-short wave television, point-to-point and broadcast transmitters have been completed or are in process of construction; the first multi-channel, ultra-short wave radio link has been inaugurated in Great Britain; and world-wide short-wave broadcast programs have been disseminated, notably the Coronation ceremonies from London.

Important extensions of national dialing and automatic ticketing, moreover, combined with the development of newer and more economical forms of transmission systems, presage an expansion in the communication art greater, perhaps, than can be conceived by the most optimistic.

Telephone Gains Widespread Throughout World

Although statistics of government communications administrations and private companies abroad are in most cases not yet available in anywhere near final form for the year, present indications are that the telephone systems of a number of the principal countries of the world will report for 1937 a heavy gain in telephones and a new high for telephone usage—local, domestic toll and long distance, and particularly in international calls.

This may be traced not only to the rapidly-growing grasp throughout the world of the value and usefulness of the telephone, but to the greatly furthered improvement and extension of toll and long distance facilities everywhere. For instance, in the cases of the telephone operating subsidiaries of the International Telephone & Telegraph Corp.—with the exception of Shanghai, China, and Spain—for which preliminary figures are available, each reports a sizeable gain in toll and long distance traffic for ten months of 1937 over the same period of 1936. Aggregate increase in the number of calls was 3,500,000, and 1936 had been the banner year in toll usage for most of these companies.

Several of the major companies in the I. T. & T. system will report for 1937 the largest station gains in their history. These include: The United River Plate Telephone Co., the big system in Argentina, which expects a 1937 gain of about 25,500 telephones; the Rumanian Telephone Co., which will gain about 10,000; The Chile Telephone Co., 8,000; the Mexican Telephone & Telegraph Co., 6,500; and the Peruvian Telephone Co., with a gain of 2,200.

The Cuban Telephone Co. will gain about 6,000 stations, which has been exceeded only by the growth in 1935 and 1925. Incidentally, the telephone statistics throw an interesting light on Cuba's recovery. The Cuban company lost 12,889 stations in 1931 alone and was down to 32,000 telephones at the end of 1933. But there were approximately 50,000 in service on December 31, 1937.

The gains of these companies, plus results of other subsidiaries in Puerto Rico, Brazil, and Argentina give the I. T. & T. system an aggregate gain of approximately 52,000 telephones for the year. The Shanghai Telephone Co., which has maintained continuous service in spite of the hostilities, has lost temporarily a considerable number of stations. These, however, are being re-established as people return and the city resumes the normal pursuit of business.

Increase in Subscribers in New Zealand

The New Zealand Postmaster General recently announced that the total number of telephone subscribers in New Zealand was approximately 140,000. This is an increase of approximately 7,545 over the previous high of 132,855 reached in December 1930.

A total of 4,533 new subscribers was recorded during the three months April-June, 1937, which is the largest increase for any previous three months. It compares favorably with the total of 16,896 new subscribers who acquired telephone service during the 12 months ended March 31, 1937. It is estimated that approximately 70 per cent of New Zealand telephones are installed in residences and 30 per cent in business and other offices.

Shanghai Telephone Co. Maintains Service

The Shanghai Telephone Co. has certainly provided one of the outstanding telephone stories of the year. Throughout the fighting, telephone service was maintained; and this means active telephone service with linemen on duty in the streets effecting repairs, moving and installing telephones. The telephone company has maintained a sizeable camp where homeless employes have lived in relative comfort and in safety since the trouble began.

The fact that the Shanghai company's central office operation is 94 per cent automatic had much to do with its ability to maintain service. However, as in similar circumstances in 1932, the employes of the company, including the native women operators, demonstrated the very highest degree of courage and steadiness in the midst of difficulties and danger—an heroic devotion to the telephone service which has added further lustre to the best traditions of the telephone industry the world over.

C. W. Porter, vice-president and general manager of the Shanghai Telephone Co., reports that: "Many expressions of satisfaction and thanks have been received for the way in which the company and its personnel have cooperated in furthering with its service a distinct feeling of safety and security on the part of the Shanghai Municipal Council and all authorities, and also on the part of the general public."

Plant Improvements of I. T. & T. Subsidiary Companies

The program of converting to automatic operation in many of its telephone subsidiaries was continued actively in 1937 by I. T. & T. subsid-

iaries with cutovers in Argentina, Chile, Rumania, Peru, Rio Grande do Sul (in Southern Brazil), Mexico and Cuba which added approximately 45,000 lines of dial equipment. Approximately 71 per cent of all telephones operated by I. T. & T. subsidiaries are now (dial) served by automatic exchanges.

In Argentina about 5,000 channel miles of carrier, involving a distance of 1,925 miles between terminals, were added during the year, providing important new toll facilities; and a program of pole line construction added improved routings.

In Rumania, through the application of carrier, additional international circuits were provided for this country whose people are extensive users of toll and long distance service. Considerable outside plant construction has been carried on in Rumania, one project providing complete new outside cable distribution plants for five towns.

In Chile, the inauguration of a line which has been in progress of construction for some months, links Santiago and the big network in the south of Chile with Iquique and the network in the north. Service has been by radiotelephone between Santiago and Antofagasta. The completion of this line provides Chile with a truly national telephone system.

Service to Magallenes, in the extreme southern section of Chile on the Straits of Magellan, has been opened through radiotelephone between the big stations at Santiago and a station of the Chilean Air Force at Magallenes.

Routine plant projects were carried out in the other countires in which I. T. & T. subsidiaries operate.

Remote Control Switchboard in Brazil

In Sao Paulo, Brazil, a 40-position remote control toll switchboard was successfully cut into service in July. This is the largest board of its type ever to be placed in use.

The operation of this equipment has been so successful that the Brazilian Telephone Co. recently placed an order with the American manufacturer for 20 additional positions to care for the anticipated growth in toll traffic during the coming years.

Telephone High Spots of the Year in Britain

The British Post Office has provided a preliminary review of 1937 of which the following paragraphs are high spots:

"An outstanding feature of the year has been the marked increase in telephone business of all kinds. The number of telephones installed is the largest in the history of the Post Office; the number of new stations connected being approximately 435,000 as compared with 416,000 in 1936. It is anticipated that the 3,000,000th telephone will be working early in 1938.

Some interesting developments have taken place in connection with subscribers' telephone apparatus, and will be introduced as supplies become available. These developments include a new type of receiver possessing a greatly improved frequency response which is expected to give an appreciable improvement in reception. Deaf-aid equipment, conference sets and loudspeaking telephones have also been the subject of further improvement.

The time service by means of the 'speaking clock,' which was introduced in London in 1936, is still proving extremely popular, the calls now made aggregating some 350,000 weekly. In view of the successful working and popularity of this service, it has been decided to extend it by means of trunk lines to provincial centers. The service will first be extended to Edinburgh, Manchester and Glasgow, and subsequently to other centers as additional equipment becomes available.

The scheme designed by the Post Office and introduced in the Folkestone area in 1935—whereby a subscriber dialing a number which is engaged receives a verbal announcement 'line engaged' given by means of automatic apparatus, in place of the standard tone signal—has been the subject of favorable report, and a trial on a more extensive basis is being arranged.

A 'special emergency' telephone call service was introduced in London in June, 1937, and is available to subscribers and all office users in automatic exchange areas. This service provides for special attention to be given to emergency calls for fire brigades, police, ambulance, etc., when '999' is dialed. All calls are routed to manual positions, where special calling signals and audible alarm circuits are provided.

Progress has continued with the mechanization of exchange plant and up to September a further 394 exchanges were put into service, making a total of 2,349.

Standardization of automatic exchange equipment has now reached a point at which orders for all new exchanges—except the smallest size of unit automatic exchange—specify the use of standard equipment throughout, including standard types of uniselector, two-motion selector, relays, associated electrical circuits, and wiring and cabling arrangements.

The provision of equipment for the automatic registration on the subscriber's meter of all calls completed automatically where the fee charged is 4d or less, is proceeding."

Trunk Communication Systems in Great Britain

"During the year," the Post Office review continues, "100 new trunk cables, aggregating 2,500 miles in length, were brought into service.

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To do her marketing by TELEPHONE—and thus have more leisure.

To make appointments by TELEPHONE—and save disappointments.

To visit with friends by TELEPHONE—and strengthen friendship bonds.

To order an extension TELEPHONE—and save many unnecessary steps.

The construction of these cables involved the laying of 1,000 miles of new duct and added 533,000 miles of single wire to the existing cable system. Inland trunk circuits, over 25 miles long, set-up totalled 600, an increase of approximately 10 per cent. Development was particularly noticeable on the longer routes; for example, on routes over 200 miles in length, the addition was of the order of 30 per cent.

"The 12-channel carrier system which was introduced in 1936 between Bristol and Plymouth on two special cables, one used for the 'go' circuits and the other for 'return,' proved very successful, and further cables were ordered for the Aberdeen - Dundee - Edinburgh, London-Guildford - Southampton - Portsmouth, London-Oxford and London-Cambridge routes.

Of these, the Aberdeen-Dundee-Edinburgh has been brought into use and confirmed the results obtained on the Bistol-Plymouth cables. As a result, the main long-trunk network of this country is to be planned on a 12-channel basis.

Coaxial and Submarine Cable Installations

"The experimental coaxial cable between London and Birmingham has been laid and the installation of the necessary equipment to enable the cable to be brought into service is well advanced. This work involves a big step beyond anything which has previously been attempted in carrier telephony. The scheme of transmission envisages sending between 300-400 conversations simultaneously in each of four copper tubes.

Two submarine cables of concentric type suitable for transmission of carrier frequencies, were laid between Aladeburgh (England) and Domburg (Holland) during June. This type of submarine cable is being used by the Post Office for the first time. If either of the two cables should become faulty, the other can be arranged to work in both directions, using half the total number of channels until the faulty cable is repaired.

Two other cables of similar type have been laid between Port Kail and Donaghades on the Belfast-Stranraer route, and a single cable between Nevin and Howth."

Nine-Channel Radiotelephone Circuit Installation

One of the most important developments of the year abroad is an ultra-short wave radiotelephone installation which transmits nine completely segregated two-way telephone conversations simultaneously, the first radiotelephone installation of this capacity in the world. It has been established by the British Post Office between Ireland and Scotland. Standard Telephones & Cables, Ltd., an associated company of the I. T. & T. which developed the system in collaboration with the engineers of the British Post Office, engineered, manufactured, and installed the system.

It is applied on one of the busiest telephone pathways in Europe connecting the telephone system of Northern Ireland with that of England and Scotland, and through London, with the rest of the world. The radio link covers 41 miles over the North Channel of the Irish Sea between Belfast, Ireland, and Stranraer, Scotland.

Long Distance Communication Systems Abroad

Wide band transmission systems during the year gained increasing predominance and considerable progress has been made since the completion of the first 12-channel multiconductor cable systems early in the year. The application of this type of equipment is being extended to the submarine cable field.

The large increase in the number of toll circuits has rendered it necessary to consider methods of reducing the time required for lining up and routine testing. Hence, special attention has been devoted to transmission measuring sets having a flat frequency characteristic and capable of giving direct reading of output levels. This type of equipment, in conjunction with continuously variable oscillators with constant output over the frequency range, in addition to reducing the time taken to make measurements, constitutes a basis for accurate automatic recording equipment.

Due to increased facilities available for long distance operation and marked advances in automatic switching, several countries are now actively investigating the problem of dialing over long distance circuits. A few countries have already introduced long distance or national dialing within their borders. Long distance automatic international connections bring up the urgent necessity for adopting an internationally agreed series of signals to perform the required operations.

The introduction of television services and the very wide band transmission required between the studio or pick-up point and the television radio transmitter has given rise to intricate problems of transmission involving the study of types of distortion hitherto considered unimportant.

Ultra-Short Wave Experiments in Denmark

Experiments with the ultra-short waves for telephone conversations were conducted by engineers of the Danish Department of Posts and Telegraphs, with the ultimate intention of establishing short wave radiotelephone connections with the numerous small isolated islands in Danish waters. It is planned to operate the service through the ordinary telephone centrals. In most cases it has been found impractical to lay cables to these islands because of the expense involved.

Radiotelephony is already used in Denmark on the ferry boats operated by the State Railways.

Toll Circuit Construction in European Countries

Outstanding during the year was the addition to the telephone network in Great Britain of the new Birmingham - Manchester - Leeds - Newcastle coaxial cable systems for telephony and television; 220 miles of such coaxial cable were under construction. Further, the following multi-conductor cable systems for 12-channel carrier were completed: Edinburgh-Aberdeen 250 miles; London-Cambridge 94 miles; and London-Oxford 124 miles.

Similar multi-channel cable systems were under construction, namely, Birmingham-Gloucester 106 miles; Aberdeen-Huntley 103 miles; London - Guildford - Southampton - Portsmouth 197 miles; and Glasgow-Edinburgh 91 miles. The four-core coaxial cables, either installed or under construction, total 343 miles and the corresponding total of 12-channel cables is 1,212 miles. In addition to these important new-type high-capacity cables, 68 trunk cables were completed or under construction with a total length of 2,016 miles as compared with 1,750 in 1936.

In France, long distance cable systems are being proceeded with at the rate of about 125 miles per year. Announcement has been made that manufacture has commenced on an important coaxial cable which eventually will extend from Paris to Bordeaux.

In Belgium, the third Brussels-Ghent cable is in process of installation.

The extensive Italian long distance network, over large sections, has been placed in operation to the full capacity of the existing cables by the completion of loading, while new

(*Continued on page* 20)

Automatic Electric Control Devices

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To obtain a weld of uniformly high quality

ELECTRICAL CONTROL

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To weld a tiny spot of precious metal to a nickel silver spring requires the most delicate control of time and temperature—a control altogether beyond the range of human hands and eyes. Automatic Electric's engineers were called in to study the problem. They found the solution in the adaptation of Automatic Electric control devices to govern the strength and timing of the welding current.

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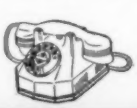
Originators of The  *Automatic Telephone*

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Simplicity + Strength = Dependability!

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Rugged, durable construction has always been a predominant characteristic of Automatic Electric design. It accounts in large measure for the remarkable records of continuous service and low cost operation which this equipment has made in exchanges in all parts of the world. Highly important in assuring long working life, this factor should be given most serious consideration in selecting the type of automatic equipment you plan to use in *your* exchange.

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(*Continued from page* 16)

cables completed during the year and under construction totalled approximately 125 miles. The 88-mile cable for the Piemontesi Railway was completed.

In Switzerland, 43 miles of toll cable have been completed and 48 are under construction.

In Holland, in addition to normal extensions to the long distance network, an important railways cable has been completed between Utrecht and The Hague, 94 miles.

In Czechoslovakia, the underground long distance cable network was extended in line with the practice of previous years. Approximately 100 km of cable were completed and a further 100 km are under construction.

The Czechoslovakian and Rumanian long distance systems are being extended by the addition of several important three-channel carrier systems over open-wire lines. The 690 km Bucharest - Kosice (Czechoslovakia) route over which they are being installed will be extended in Czechoslovakia to Trencin (210 km). The Bucharest-Pancevo (Yugoslavia) (460 km) route handling traffic to Belgrade will be linked to a new system—also under construction—in Yugoslavia from Szeged to Pancevo (480 km).

Large additions have been made annually for many years to the extensive Swedish long distance network. During the year approximately 440 km of cable have been completed and an additional 400 km were under construction.

In Norway, the first 114-km section of cable to include single channel carrier circuits was completed between Oslo and Moss over the route which will be extended to the Swedish border and which eventually will provide a carrier circuit linking the two countries. An important three-channel carrier system over open-wire lines, totalling 680 km and linking the towns of Kristiansund, Stavanger, Notudden and Arendal, and another 400-km system between Lillestron and Trondjem, are under construction.

To the Danish underground network, 156 km of cable were added during the year; 111 km were in process of installation.

Toll Circuits in Various Parts of the World

The completion of the important cable between Warsaw and the Polish port, Gdynia, is now well advanced; the final 217-km section between Thorum and Gdynia is under construction.

An important Egyptian cable for the Anglo-French Suez Canal Co. was in process of installation. This cable will provide telephone communication over the entire length of the Suez Canal (189 km) and also between important and intermediate points.

The Australian Commonwealth has evolved an underground long distance cable plan and the first cable section is now under construction between Melbourne and Geelong (approximately 65 km). This is part of the route followed by the present open-wire carrier circuits which link Melbourne with Tasmania over the recently-installed Bass Strait submarine cable system.

It is interesting to note that the traffic over this long submarine cable, inaugurated in 1936, has already reached such proportions that means are now under examination for extending the originally provided traffic facilities.

In South Africa the first long distance cable between Johannesburg and Pretoria (56 km) was completed. An important three-channel carrier system over open wires is under construction for the 1160-km route between Johannesburg and Port Elizabeth.

Long Distance Telephone Developments in India

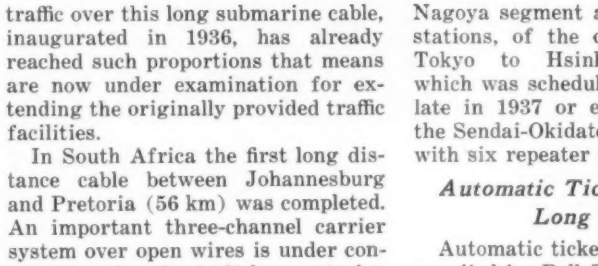
The Nizam's government in Hyderabad gave attention to the linking up of the state telephone system with the all-India trunk line during 1937. The India Telegraph Department linked Bolarum with the trunk line at Sholapur, but this had not been opened to the public, so far as private connections are concerned.

A carrier system which will enable four telephone and four telegraph messages to be carried over a single wire was expected to be working between Delhi and Bombay before the close of the year. In the initial stages only the telegraph section of the system was to be worked. The line between Madras and Bombay was to be similarly modernized with completion expected in January.

At Singapore, the 68-km underground cable system has been completed.

In Russia the longest three-channel system over open-wire lines ever undertaken as a single system is now in process of construction from Moscow to Khabarovsk on the border of Manchukuo, 5,300 miles (8500 km). This carrier system will also incorporate a broadcast program channel embodying several novel features.

In Japan, the two outstanding additions of the year in the non-loaded carrier communication system are: inauguration of the 225-mile Tokyo-Nagoya segment and seven repeater stations, of the cable system from Tokyo to Hsinking, Manchukuo, which was scheduled to be completed late in 1937 or early in 1938; and the Sendai-Okidate cable (213 miles) with six repeater stations.



Automatic ticketing on toll calls was first placed in public service in Bruges, Belgium. The printing register is shown here with the cover removed.

Automatic Ticketing of Long Distance Calls

Automatic ticketing, developed and supplied by Bell Telephone Mfg. Co. of Antwerp, subsidiary of the I. T. & T., has more than fulfilled expectations. At the end of 1937, 14,650 lines in 19 exchanges equipped with this facility were on order or installed. Of this number, 11,650 lines represent new equipment of the 7-D rotary type.

An economical method of introducing automatic ticketing in existing 7-A1 type rotary exchanges has been devised and will be used immediately in a number of large exchanges. This new method is also applicable to all forms of step-by-step equipment.

During the year, new equipment of the 7-D rotary type, equipped with automatic ticketing, was placed in service in the Belgian seaside towns of Knocke, Le Coq, Heyst and Zeebrugge. The pivotal switching cen-

ter of this network is the town of Bruges, where the printing registers serving the complete network are located.

All multi-fee calls outgoing from the outlying exchanges of Knocke, Heyst, etc., are trunked through Burges, the printing registers in the latter town producing tickets which contain the number of the calling party, the number of the called party, the duration of the conversation in minutes, the basic tariff, the time of day and the date. In short, all the data formerly given by "manual ticketing" methods is now produced automatically.

This constitutes a remarkable achievement when it is considered that the calling parties may be connected to exchanges some 25 or 30 km distant from Bruges, where the tickets are produced; also that the identification and printing of subscribers' numbers are accomplished entirely automatically and without requiring any cooperation on the part of subscribers.

The centralization of the printing registers in the trunking center of the network permits corresponding centralization of the ticket sorting and accounting, as well as the giving of information to the public by the special service control operator.

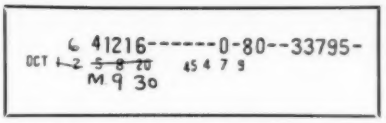
The exchange of Knocke operated during the whole of the busy summer season, and the performance of the automatic ticketing equipment was highly satisfactory in every way.

National Dialing in European Countries

During the year subscriber-to-subscriber dialing service was successfully introduced in the rotary exchanges of Haarlem and the surrounding exchanges of the bulb district, Holland. Thus approximately 20,000 subscribers in 24 exchanges now can reach Amsterdam and the surrounding exchanges by dialing a toll prefix followed by the number of the wanted party.

In Zurich, Switzerland, the first fully automatic national toll exchange is under construction. The first stage will include equipment for 280 toll lines with an ultimate of 1,840 toll lines. The installation of this equipment is part of the plan of the Swiss P. T. T. to place the whole country on a full automatic toll basis. When completed, only international connections will be handled manually. Five international toll exchanges are foreseen for serving the entire country.

This development in Switzerland is a good illustration of the trend of development in Europe. National



This is a record of the first call ticketed automatically in Bruges, Belgium, before service was open to the public.

dialing systems are under consideration in a number of countries, some based on full automatic, subscriber-to-subscriber operation, and others on operator dialing. Paralleling this trend is the larger conception, now under consideration by the C. C. I. F., of a fundamental toll plan for the whole of Europe.

Automatic Installations in European Cities

The French P. T. T. has commissioned Le Materiel Telephonique, Paris, to manufacture rotary automatic equipment for the Paris regional area. This network, at present operated manually, is some 25 km distant from the center of Paris and forms a 15-km belt around the Paris suburban area. The population included in the regional area is now about 1,000,000 with about 40,000 telephone subscribers.

The conversion from manual to automatic operation will be made in successive stages. About 9,540 lines in 14 exchanges are under construction. When complete the area will be equipped with about 60,000 lines in approximately 200 exchanges.

When this project is carried through, the entire Paris area will have rotary automatic telephone service, for among its many celebrations this year, Paris signalized the completion of a nine-year program which has provided the city proper with a completely automatic telephone system. Work is progressing on the conversion to automatic of its vast suburban area, and that is scheduled to be complete in two years. Now, as stated, comes the order to convert the third outer ring of cities and towns; 475,000 lines of rotary automatic equipment are involved in the entire Paris project.

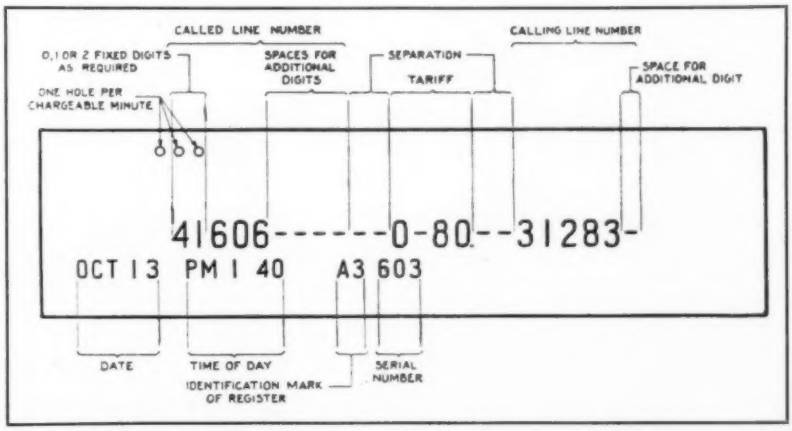
Production of the new 7-A2 type of rotary equipment continues to increase. The number of lines of this new equipment installed in or on order for many important cities, including Brussels, Bucharest, Budapest, Oslo, The Hague, Copenhagen, Rio de Janeiro and Lima, totals nearly 200,000.

The rotary system was developed by laboratories of I. T. & T. subsidiaries and is manufactured at several of its principal factories as well as at other factories on a licensee basis. It is now installed in 900 exchanges in 40 countries. The total number of lines installed or on order at the end of 1937 was 2,120,000.

Conversion to automatic operation in Europe is taking place in the smaller towns and rural sections as well as in the larger communities. The unattended rural automatic systems are being installed on a considerable scale in the British Isles, France, Belgium, Luxemburg and in most of the other countries of the Continent for which early information is at all available.

Trend in Commercial Radiotelephony

The year 1937 was characterised by an increasing demand for commercial radiotelephony facilities. An outstanding feature of new transmitters was the incorporation of facilities for rapid changes of wavelength. In England and America this tendency, combined with the demand for simpler control, has led to the extension of impulse controls operated by a telephone dial.



When a toll call is finished the printing register records the necessary information on a ticket, as shown, and ejects it through a chute into a container.

Ultra-short wave operation continues to be the direction in which commercial radiotelephony is advancing most rapidly. Its extension is in some cases due to the highly-efficient aerials, which may be erected without excessive cost, and to reduced atmospheric interference; and, in other cases, to the possibility of transmitting wide bands of modulation frequencies.

Multi-channel operation of radio links has been brought into the practical field of communication by the use of these properties of ultra-short waves; 1937 marked the introduction for the first time of a multi-channel unattended, remote-controlled radio link in the regular long distance telephone network.

This unique installation is a nine-channel multiplex radio link connecting Belfast and Stranraer, which was formally opened for public service in August, mentioned previously. Possibility of the installation of two more similar links connecting Dover and Calais, thus furnishing 18 additional telephone channels between England and France, has been mentioned in the press. Simpler single channel equipment has been used off the coasts of Scotland for extending telephone facilities to the nearby islands, since the character of the service does not warrant the high cost of installing submarine cables.

Plans involving the operation of long distance international links have been influenced by the drop in field-strength which is expected in the year 1940 due to sun-spot activity. Periods of severe attenuation have already been experienced on transatlantic circuits and have caused a demand for the erection of high-gain directional aerials.

On account of its wide band operation, the rhombic aerial has been favored in meeting this demand. Such aerials have recently been installed at Geneva, Budapest, Bangkok and Durban, and it seems likely that further installations will be made to replace tuned arrays now in operation. This possibility, taken in conjunction with rapid band-changing by means of telephone dials, indicates the trend towards simplifying the operation of transmitters.

On international links of first importance, high-gain aerial systems are already in use, but it is anticipated that at about the year 1940 a dozen decibels of additional gain will be needed for 40 per cent to 50 per cent of the time during sunspot periods in order to maintain the circuits at a commercial level. Since the average transmitter carrier power is already of the order of 15 kw, still more gain in the aerial systems is economically justifiable. The older types give no certain improvement in operation beyond a gain of the order of 14 decibels, since the vertical polar diagram thereafter becomes too sharp.

This easily-understood sales message was imprinted on the reverse side of billing envelopes recently used by the Illinois Bell Telephone Co.

The Bell Telephone Laboratories have, therefore, developed for receiving purposes, the multiple unit steerable antenna (MUSA). This system gives much greater directivity in the vertical plane since the wave angle is continuously adjustable by the rotation of a suitable control system.

The MUSA aerial system is a fundamental development in the short-wave art since it gives promise of overcoming selective fading by arriving at its component causes.

Television Shows Consistent Progress

In the field of television the year brought forth no startling changes in the United States or abroad. Progress, however, has been consistent.

The British Broadcasting Corp. standardized on the Marconi E.M.I. system and has ceased transmission with the Baird system. Program time is now three hours daily, a large part of the program being direct vision by means of the Emithron camera.

Some 14 manufacturers showed television receivers at the recent exhibition at Olympia (London). The prices ranged from £38 to £125.

In France, the old television equipment has been entirely replaced by modern studio and transmitter equipment, capable of giving 455 lines. Direct or film signals are used with the pick-up located either at the P.T.T. studio or at the Radio Palace at the Paris Exhibition. A vision transmitter of 30 kw peak power, supplied by Le Materiel Telephonique, Paris, has been installed at the base of the Eiffel Tower and has been connected to the antenna at the top by a concentric cable. The vision transmitter operates on 46 megacycles and the sound transmitter on 42 megacycles.

In Germany the Berlin 15-kw transmitter has been sending a 180-line picture, but it is planned to change to 441-line interlaced transmission using positive modulation, the direct current component only being transmitted. Three new transmitters are reported to be planned: one on the Broechen, the highest point in the Hartz mountains; one on a peak near Frankfort, and one near Berlin.

Work on the first is understood to be well advanced. Receivers with cathode ray tubes 25 inches in diameter are used, the 14 inch by 16 inch images produced being reported as brighter than ordinary moving pictures.

E.I.A.R. are understood to be considering the installation of a 30-kw peak vision transmitter in Rome.

It has been stated that Russia has placed an order for a complete studio system and transmitter with R.C.A.

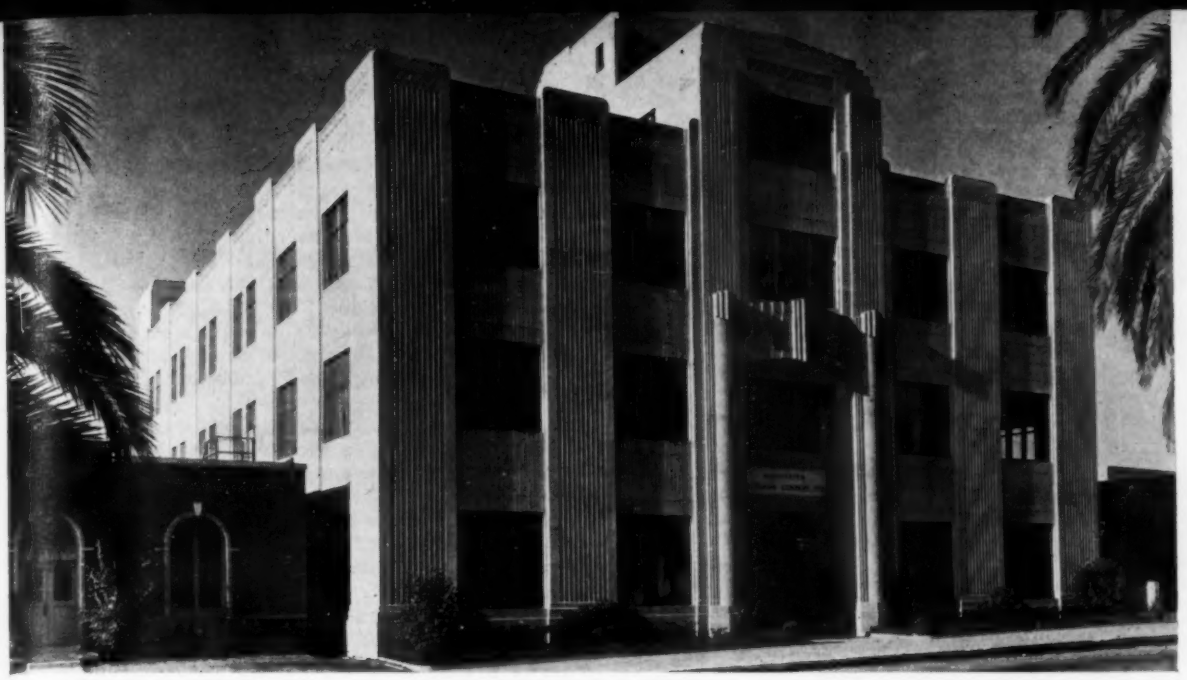
There has been an advance in the intermediate film pick-up by Fernseh A.G. By means of a special process, a film scanner has been produced which photographs, develops and transmits the picture within 16 seconds of the action.

The new N.B.C. Washington, D.C., studios, opened in 1937, include television equipment. Extensive provision has been made for visual broadcasts.

Wide publicity is given periodically in the popular press to television programs being received at great distances. Such reception, however, as is well known to technicians, is of a distinctly freak nature, the range covered reliably being of the order of 30 miles. Since television programs are expensive, it seems obvious that television for some time to come, at least, will be dependent on coaxial cables for distribution purposes.

New Types of Subscribers' Telephone Sets

In recent years much effort has been expended on the design of distant-talking and loudspeaker subscribers' telephone set. The troublesome problem of the disturbing factors encountered in such a set—relatively minor in the ordinary telephone—have been investigated and important progress made. A loud-speaking conference system for use in association with exchange or P.B.X. lines has also been produced.



Plans Even Greater Construction Program for 1938

RAPID GROWTH has been experienced in the past few years by the Associated Telephone Co., Ltd., which operates in the fast-growing Los Angeles metropolitan area in southern California. With the recent completion of a fine three-story exchange and office building in Santa Monica, the headquarters of the company have been moved to that city from Long Beach.

From the executive offices in Santa Monica are directed the operations of more than 20 exchanges which closed the year 1937 with a total of 95,000 stations in service, a gain of approximately 12 per cent over the company's previous station high.

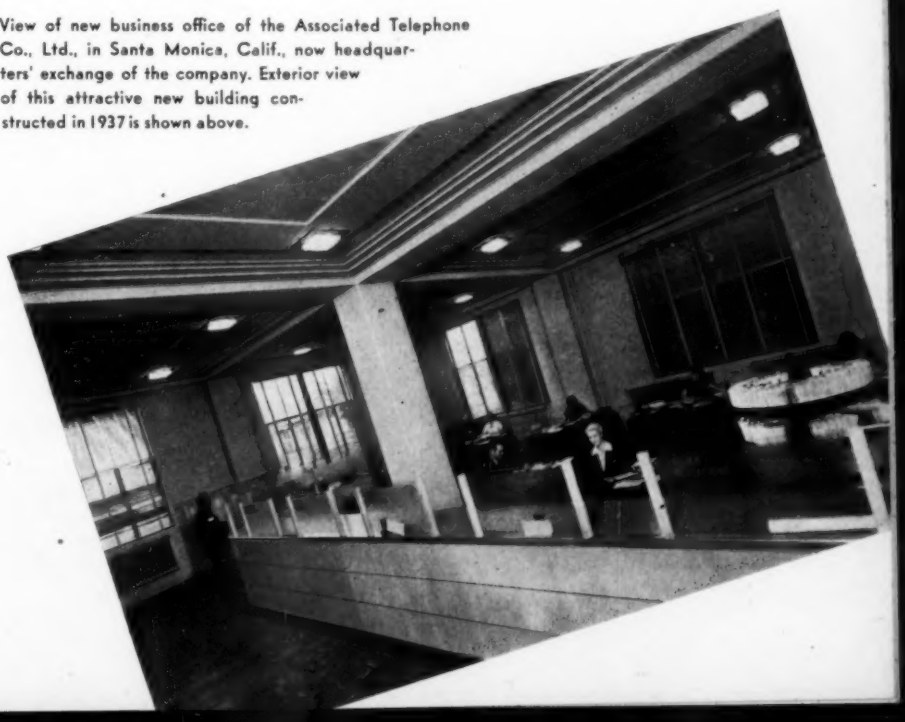
After closing the year 1937 with a net increase of more than a million and a half in its plant investment, the company is planning a construction program for the current year which, it is expected, will result in a net addition to plant of approximately $1,726,000.

The recently-completed Santa Monica exchange and headquarters' building now houses the executive offices of the company, a new commercial office and automatic equipment serving a part of the Santa Monica exchange. This office also is headquarters for the western operating group of the General Telephone System—Southwestern Associated Telephone Co. and Haskell Telephone Co. with division offices at Lubbock, Texas; Interstate Telephone Co. with offices at Spokane, Wash., and San Joaquin Associated Telephone Co. The latter company is a subsidiary of the Associated Telephone Co., Ltd.

The Santa Monica building is a three-story structure of modern design, built of reinforced concrete, heated by a low-pressure hot water system, with forced ventilation in all inside offices, and dehumidifying and ventilating equipment for the switchroom. Especial attention has been paid to office lighting, which is of the latest available type, with ample illumination provided and all glare eliminated.

One thousand lines of automatic equipment have just been installed in the company's West Los Angeles office. An addition to the switchroom in this office is at present under construction and the installation of an additional 1600 lines will be started as soon as space is available.

New buildings were erected in Ontario and Upland (TELEPHONY of December 26, 1936) and the building at San Bernardino was completely re-



View of new business office of the Associated Telephone Co., Ltd., in Santa Monica, Calif., now headquarters' exchange of the company. Exterior view of this attractive new building constructed in 1937 is shown above.

built and modernized in 1936. The company's program for the current year includes plans for the erection of a new central office building in North Long Beach, to take care of rapid expansion in that area.

The expansion of plant facilities to keep pace with the public's requirements for telephone service has made necessary additional financing, which is being provided by the issuance of bonds, preferred stock and common stock. Thus the company recently solicited and secured authority from the California Railroad Commission for the sale of $1,800,000 face value of its 4 per cent series B bonds, due July 1, 1965, and 36,688 shares of its $1.25 series preferred stock.

A previous decision of the commission authorized the issuance of 36,515 shares of common stock, all of which were issued to General Telephone Corp. in partial liquidation of amounts borrowed from that company (the parent of Associated Telephone Co., Ltd.) for the purpose of financing additions to plant.

The issue of bonds and preferred stock has been underwritten by Bonbright & Co., Inc.; Paine, Webber & Co.; Mitchum, Tully & Co., and Blyth & Co., Inc. The bonds will be sold to the public at 102½, and the preferred stock at $22.50. The effective date of the registration statement filed with the Securities & Exchange Commission in connection with the issuance of these securities was December 13, 1937.

During the 11 months ended with November 30, 1937, the company gained 8,662 stations and as of November 30, 1937, had in service 95,079 company-owned telephones. During the same period the net increase in plant investment was $1,517,454; and the total plant investment at the end of November, $17,674,037.

The net additions to be made to the plant in 1938 have been estimated as approximately $1,726,000. In October, 1936, the company passed its pre-depression "high" of 84,630 stations and now serves approximately 12 per cent more stations than at its previous high point.

The Associated Telephone Co., Ltd., serves a rapidly-growing territory in the Los Angeles metropolitan area, including West Los Angeles, Santa Monica, Malibu, Venice, Redondo, Hermosa and Manhattan Beaches, Long Beach, Huntington Beach, Laguna Beach, Pomona, Claremont, Covina, Baldwin Park, Azusa, Glendora, Puente, Ontario, Upland, San Bernardino, Lancaster and Lake Arrowhead.

The affairs of the company are under the direction of C. F. Mason, president, who is also a director of General Telephone Service Corp. The other officers of the company are Eliot H. Cheadle, vice-president; Harlan W. Holmwood, secretary-treasurer; Marion Mountain, assistant secretary-assistant treasurer, and G. T. Ellis, auditor. Fred E. Norris is in charge of plant and equipment operations and commercial and traffic matters are under the direction of Ernest W. Watson. Ernest Irwin, who is also secretary of the California Independent Telephone Association, has charge of commission and legal matters, taxes, etc.

Recent Developments In Laboratory and Research Work

SOME STUDIES AND RESEARCH developments of the Bell Telephone Laboratories, Inc., for improving telephone service, materials and methods of construction

A Laboratory Evaluation of Wood Preservatives

With a total of 15,000,000 poles in its plant and additions and replacements totaling as high as 1,000,000 poles yearly, the Bell System has for many years made considerable expenditures for research in wood preservation. The results, which have been put into effect largely through cooperative effort with suppliers of timber, have been very satisfactory.

One result which has been greatly desired is to find some quick way of evaluating the effects of a new material proposed for use in the preservation of wood. Thirty years ago such determination was made by treating poles and setting them in the plant; but this required observations over a long period of time.

More recently reliable but more rapid results have been obtained by setting samples of wood—"saplings"—in the ground in locations where decay, due to the micro-flora and fauna which act as scavengers for the forest, is particularly active. These methods are still finally necessary but are being supplemented by improved laboratory methods.

Recently there has been evolved in the Bell Laboratories a simple laboratory technique for the assay of preservative materials. The test involves a measurement of the actual decay resistance of the treated wood. It does not, due to numerous variables inherent in the laboratory, take the place of outdoor tests.

The new method is based on a study of previous laboratory methods employed in this country and abroad. Small blocks of timber are prepared and treated with the wood preservative under test. They are then supported by a thin slab of untreated wood on top of a small bottle which is placed inside a larger screw-cap bottle.

Through holes bored in the test piece and the thin slab of supporting wood are passed wooden rods which act as a means of anchorage and as wicks for conduction of water to the wood under test. Water is placed in both bottles and, after sterilization of the complete setup, the thin slab of wood is innoculated with a test-fungus which has been growing in a nutrient solution.

The screw-cap bottle is then sealed and placed in an incubation room at proper temperature for a period of about 24 weeks. At the end of this period the blocks are reweighed and finally dissected to determine the loss of strength occasioned by the attack of the fungus. The weighing, of course, determines the loss of material during the period of test.

An important part of the test is to bring the test blocks to the same point of moisture equilibrium at the

beginning and end of the test in order to eliminate the moisture factor in determining the actual weight loss.

This laboratory method has been in constant use for the past three years and hundreds of complete assays have been made which to date are, when interpreted in the light of experience, in good agreement with the outdoor tests.

The method is valuable in supplying a quick, but not final, answer to such questions as the effect of manufacturing and other variations in type of preservative material and the properties of new preservative materials for which advantages are claimed.

Lead-Calcium for Storage Batteries

Since the introduction of common battery switchboards in the Bell System about 40 years ago, the storage battery has been a very important element in telephone service. Its characteristics have been studied for many years and cooperative work done with the manufacturers looking forward toward improvement of performance characteristics.

A number of years ago a fundamental investigation was started in the Bell Telephone Laboratories with the immediate objective of determining the nature of a gas given off by central office storage batteries on overcharge. This gas had long been supposed to be sulphur dioxide but a series of chemical and spectroscopic tests finally identified it as antimony hydride derived from the antimony component which is introduced to harden the lead grids in commercial storage batteries.

A quantitative study of the amounts of this gas given off during the charge-and-discharge cycle of the battery was found to be of considerable significance as an indication of the battery's behavior—a result which had not been expected when the investigation was started.

It was found that the time gas discharge characteristics resulted largely from a leaching out and redeposition of antimony, which not only weakened the grid structure of the battery but increased the self-discharging characteristics of the cell. This action, of course, resulted in loss of charge of the battery together with other difficulties.

After further investigation it was found that a lead-calcium alloy, containing less than one-tenth of a per cent of calcium, would give the battery plates the necessary hardness and would apparently give much more satisfactory results for telephone battery use than lead-antimony.

Experimental lead-calcium batteries made up in the Bell Laboratories have shown a rate of self-discharge of only about one-fifth that of lead-antimony cells. It follows that much less power would be required for the maintenance of telephone batteries constructed of lead-calcium.

The realization in a commercial way of the advantages which are indicated by these results will require manufacturing development and a period of service trial of lead-calcium batteries in order to determine and correct difficulties which may be introduced in practice.

Microchemical Analysis in Bell Laboratories

One of the many interesting and productive phases of telephone research is that which deals with the analysis of extremely small samples of particles, impurities or corrosion products. This type of research requires the reduction of apparatus size and of scale of operations to a point in keeping with the size of the samples obtainable.

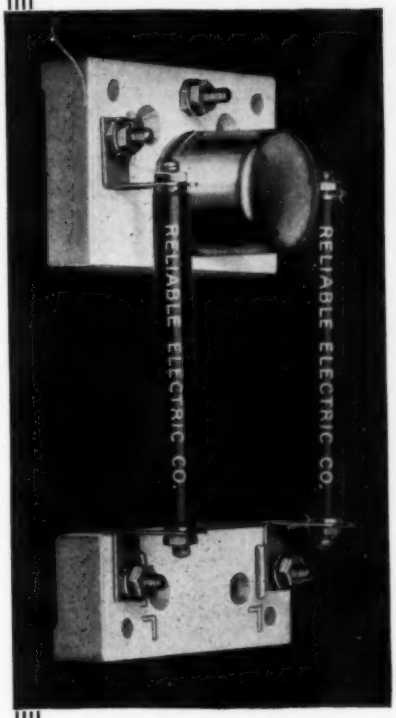
It also requires the development of entirely new techniques, apparatus and chemical reactions. For example, by means of an electrolysis cell, used under the microscope, it is possible to observe the deposition of metals from tiny drops of solutions. Less than 0.001 of a milligram of copper, or even one-tenth of this quantity of zinc, may be detected in this way.

Another process rarely used in ordinary analysis but of great service in microwork is that of sublimation. A few thousandths of a milligram of a volatile crystalline solid may be separated in this way from a large bulk of inert material. In order to apply this process to dusts and corrosion products an improved microsublimation chamber has been designed by the Bell Telephone Laboratories.

The apparatus is so arranged that both temperature and pressure can be regulated. The vapor condenses on a water-cooled microscope coverglass and the recovery is practically quantitative. As little as 0.002 of a milligram of mercuric iodide was found to give a deposit of definitely recognizable crystals.

A number of methods have been developed and used by the Bell Laboratories in fundamental studies to learn the effects of the dusts found in the telephone central offices on the surface resistance of metals used in

Reliable



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It has a special low absorption porcelain base, phosphor bronze fuse clips and springs, and heavy binding posts with treated studs.

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machine-switching equipment. In these studies microchemical methods have figured largely in the identification of the individual dust particles as well as in the quantitative determination of the major type of components.

Another use for these techniques has been in connection with the study of electrolytic corrosion in the windings of relays and other similar types of apparatus which may occur as the result of very small quantities of salts present in the insulating materials or acquired during manufacture.

When moisture due to humidity is present, these salts furnish electrolytes which may cause corrosion, resulting in open circuits and other troubles. In tracing the sources of this type of corrosion, microtechnique has afforded a satisfactory method of attack.

A Laboratory Method for Measuring Plating

An item employed by the millions in the telephone plant is the common machine screw and other threaded parts. Like all other items involved in telephone equipment, careful attention has been given to the standardization and improvement in quality of these threaded parts.

Typical of Bell System's development work applying to items of this kind is an ingenious laboratory method devised to supply information which has not otherwise been readily obtainable. This involves the determination of the thickness of the plating or finish on screw threads.

Such protection for screw threads is important because telephone apparatus is subjected to a very wide range of conditions of temperature and moisture. The protecting plate best suited to a screw thread, from a dimensional fit standpoint, is one which gives the maximum protection per milligram per square inch and is capable of the closest control of distribution and thickness over the uneven threaded area.

The new method for determining thickness and protection on the thread employs an optical contour projector. This produces a highly-magnified contour of the screw or other threaded part on a screen.

A partial exposure of the image of the top of the thread is then made on photographic paper through a graph screen which provides graph lines along the contour of the thread to aid in analyzing results. While the thread under observation and the recording paper are kept in their relative positions, the protective coating is next removed from the threads by a stripping solution.

A second photographic exposure is then made, this time of the stripped screw with the image superimposed on the image already made of the plated screw.

This procedure shows accurately the thickness and uniformity of distribution of the plating and makes it possible to judge not only its suitability for screw thread use but also the adequacy of the process in applying it.

As an example of the utility of this method, in one instance an uneven distribution of zinc plating, which resulted in poor thread form and inadequate protection against corrosion, was corrected by adoption of a different kind of plating. This method has been very useful in determining the variation in thickness of plating and in analyzing samples of various finishes.

Advancement in Studies of Dynamics of Relays

While the electrical characteristics of relays and similar apparatus have been studied for many years, it is only recently that important advances have been made in determining the dynamic behavior of the mechanical structures involved.

Recently an improved method of dealing with vibration studies in relays has been developed in the Bell Telephone Laboratories. This method measures the motion of relays or similar parts directly and correlates the magnitude, velocity and phase of that motion with the current in the electrical circuit.

The method involves projecting the shadow image of an edge of the moving part onto the recording paper of a high-speed oscillograph and making a graphic record of the motion of that part as a function of time. There may also be made simultaneously on the recording paper an oscillograph record of the electric current which caused the motion—or which was caused by the motion.

In this method the magnification of the mechanical movement may be as much as 100 times. These records show, for example, the natural frequency of a spring, contact chatter, the correlation between the mechanical rebound of a relay armature and the reopening of contacts under its control, together with the electrical data desired.

The equipment involves the use of an optical system and light source together with suitable recording oscillograph.

Major Developments in Transoceanic Telephony

In reviewing the history of transoceanic telephony, since opening of commercial service January 7, 1927, it is obvious that certain major developments have made this service possible. One of these is the water-cooled vacuum power tubes which made high-power telephone transmission possible on a practical basis.

Another is single side-band transmission which, as compared with ordinary radio transmission, increases the effectiveness of a radiotelephone system by about ten to one in power. Another very important element is that necessary to prevent voice-frequency singing in the radio circuit. This is known as the "voice-operated device, anti-singing," commonly shortened by using the initial letters to "vodas."

Additional developments applicable to radiotelephone communication have accompanied the introduction of the short-wave art which contributed greatly to the radio space available for long distance transmission. Through the increased possibilities of directive transmission, power requirements were lowered and the cost of transmission was reduced.

As examples of short-wave developments there are "rhombic" antennas for transmitting and receiving which cover a wide wave-length range efficiently, and "diversity" methods of reception in which the outputs of individual separated antennas are combined to reduce noise and improve quality. The latest development in this direction is a system in which the outputs of some 15 or 20 antennas are combined in accurate phase relation.

This system is known as the "multiple unit steerable antenna," shortened to "MUSA." It consists of a number of mechanically fixed antenna which in themselves are each directive in a horizontal plane and so connected together that the group can be made selective in a vertical plane so as to select any desired vertical component. This steering is not done by any physical orientation of the antenna but by electrical means.

Another development that forms a necessary part of the radiotelephone circuit is that of privacy systems which are now commonly used and which convert speech, as picked up by casual listeners, into apparently meaningless sounds during its radio transit. A further contribution to the successful operation of such circuits has been the accurate stabilization of frequency which reduces mutual interference between stations.

Rate Cases Diminish During the Year

MANY Bell rate cases in various states were settled by compromise or by voluntary reductions. Status of Bell rate cases in ten states during 1937

Ohio: The Ohio Bell case, which has been in controversy for nearly 15 years, is now back where it started—before the state commission. The United States Supreme Court which assumed jurisdiction in the case in November, 1936, ruled in April, 1937, against the Ohio commission on the grounds that fundamentals of a trial were denied the company.

The decision of the Ohio Supreme Court was reversed and the case sent back to the commission. Although hearings were set for late September, no progress was made due to lack of funds by the commission. As the year closed there was talk of settling the case by compromise.

On January 29, 1937, the Ohio Public Utilities Commission announced that the Ohio Bell Telephone Co. had agreed to a rate reduction amounting to $1,912,000 annually, new schedules to become effective April 1. This announcement was the result of a series of conferences between company and commission officials.

Wisconsin: The rate reduction orders of the Wisconsin Public Service Commission against Wisconsin Telephone Co. were heard by Judge August C. Hoppman of the Dane County Circuit Court. During the hearings, which commenced in late January and extended over a period of several months, additional testimony was taken by the court. The case was then adjourned to permit the commission to decide if it wanted to change its orders after hearing the additional testimony.

The commission held several hearings during the summer and on October 20 reaffirmed its rate reduction orders of March 24, 1936, and July 5, 1934, and its order of December 20, 1935, reducing depreciation rates. The commission's decision reaffirming these orders was filed with Judge Hoppman. After hearing oral arguments in late December, the circuit court was expected to hand down a decision early in the new year. It is anticipated that the decision, when it is made, will be appealed to the Wisconsin Supreme Court.

The application of the Wisconsin Telephone Co. for authority to make a 4.4 per cent surcharge on its monthly bills to subscribers for local exchange service, to cover an emergency tax of approximately $533,000 yearly imposed by the state legislature, was denied by the commission.

Louisiana: In Louisiana the state supreme court upheld on March 1 the commission's order of March 2, 1935, reducing rates of the Southern Bell Telephone & Telegraph Co. The case was appealed to the United States Supreme Court. The commission in the meantime opened a state-wide investigation of the Southern Bell and hearings commenced July 26.

The entire rate controversy was settled by compromise July 27 when the company agreed to adjust intrastate toll rates to conform with interstate rates and dismissed its appeal to the United States Supreme Court and also its suit in the United States District Court.

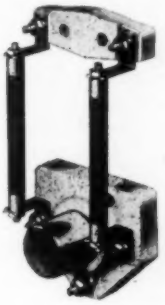
Georgia: A compromise was reached July 14 between the Georgia Public Service Commission and the Southern Bell Telephone & Telegraph Co., resulting in the commission withdrawing its "show cause" order as to why rates should not be cut and the Southern Bell withdrawing its three-year-old injunction proceedings in the Federal court. The company also agreed to make charges for intrastate calls on the same basis as interstate charges.

Oklahoma: The rate investigations of exchanges of the Southwestern Bell Telephone Co. by the Oklahoma Corporation Commission continued during the year. The commission orders in the Tulsa and Oklahoma City cases were taken to the Oklahoma Supreme Court which affirmed the Tulsa order in July. The court denied a rehearing on an appeal, following which the Southwestern Bell appealed to the United States Supreme Court which, on December 6, decided to review the case.

The commission in May denied the request of the Southwestern Bell for a state-wide investigation instead of

SANDS

THE TYPE 12 SUB-STATION PROTECTOR



This popular type of indoor protector consists of two blocks of porcelain—the line end being equipped with fuse clips only while the other end has fuse clips, ground connection and a well for the discharge blocks. Regularly equipped with seven-ampere, fiber-type fuses with nutted ends, and Type 2105 discharge blocks. Write for further information regarding this and other Sands protective devices.

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AUTOMATIC ELECTRIC COMPANY

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Chicago

rate inquiries by exchanges. Appeal was then made to the Oklahoma Supreme Court which last month denied a request of the commission to dismiss the Bell's application for a state-wide inquiry. In September the Southwestern Bell filed an application for authority to increase rates in 14 Oklahoma cities. A month later the commission issued an order restraining the company from making the increased rates effective, the commission holding that the rates were sufficiently high.

Alabama: In October, the Alabama Supreme Court declined to alter or remand to the Alabama Public Service Commission for further fact-finding and reconsideration the commission's order of April 2, 1936, reducing rates of the Southern Bell Telephone & Telegraph Co. by an estimated $250,000. On May 8 the state commission issued an order directing that the intrastate toll rates of the Southern Bell company be reduced to conform with interstate rates.

South Carolina: The rates of the Southern Bell Telephone & Telegraph Co., it was announced by the South Carolina Public Service Commission in October, were reduced an estimated yearly amount of $173,000. The reduction was the result of a long series of conferences between commission members and the company officials. It affected local exchange rates, handset and extension telephone rates, and placed charges for intrastate toll calls on the same basis as interstate.

Tennessee: The Tennessee Public Utilities Commission issued a show-cause order against the Southern Bell Telephone & Telegraph Co. as to why its rates should not be reduced. Following several conferences, the Southern Bell rejected a compromise offer of the Tennessee commission for a rate reduction of $800,000 a year. Hearings were scheduled for August but were continued to October and later to November.

In early November the commission ordered the Southern Bell to discontinue its 15-cent monthly charge for handset telephones.

Illinois: The Illinois Commerce Commission, on November 23, ordered the Illinois Bell Telephone Co. to reduce its rates approximately $2,600,000 a year. This was the result of an investigation inaugurated by the commission three years ago. The new rates, which became effective January 1, were accepted by the company for a trial with the statement that if the returns do not prove adequate a revision would later be asked. The reductions included the elimination of the 15-cent monthly charge for handset telephones.

Pennsylvania: The Pennsylvania Public Utility Commission during the summer commenced an investigation of intrastate toll rates of the Bell Telephone Co. of Pennsylvania and hearings were held during the fall. On October 27 the commission authorized a state-wide investigation of the rates and practices of the Pennsylvania Bell, meantime continuing study of the intrastate rates.

▼ ▼

"Something Different" in Christmas Advertisements

Something different in Christmas advertisements was created by the advertising office of the Lincoln Telephone & Telegraph Co., Lincoln, Neb. It was an advertisement containing an exact reproduction of a Currier & Ives lithograph print, finished in the manner of an old-time wood cut.

This particular type of advertising was selected for use during the 1937 holiday season in an effort to combine, in an attractive manner, the reduction of long distance Christmas and New Year rates with the theme "Going Home for Christmas."

The art work was produced by Joe Hartley, artist for the Lincoln company, who, in addition, painted in colors a second reproduction, eight feet long and four feet high, for the Lincoln company's display window. People flocked to this window during the month of December, and many requests were made for the painting after its removal.

HOME FOR CHRISTMAS
!
In the America of pre-Civil war days, it was impossible to go home for Christmas in any other manner than physically. . . .This still remains the finest way to join the home circle during the holidays BUT – if it is impossible, you may still GO HOME BY TELEPHONE !
LONG DISTANCE "NIGHT RATES" will be in effect all day CHRISTMAS and NEW YEARS
THE LINCOLN TELEPHONE AND TELEGRAPH COMPANY

Advertisement run in local newspapers before Christmas by the Lincoln (Neb.) Telephone & Telegraph Co.

The "Currier & Ives craze" that has been growing in strength throughout the country for several years had its origin between 1835 and 1889 when Nathaniel Currier and James Ives, of New York, published "colored engravings for the people." The original prints sold for prices ranging from 25 cents to $1. They portrayed life as it was then lived, and such prints as "Winter in the Country," "The Old Homestead," "Home for Christmas" and "Life on the Prairie" were typical, in a highly-colored manner, of the history of an era.

When interest was revived in these prints about 15 years ago, it was found that most of the "originals" had been lost or destroyed, and such as remained had become collector's items. Original prints which sold for $1, today bring sums ranging up to $1,500, for they represent an America which is no more; an America which was conquering a frontier and in which there was sturdy independence and a high courage that found joy in simple living.

Dividend Check Sent Out Ahead of Schedule

By way of a Christmas surprise the Athens Home Telephone Co., of Athens, Ohio, sent dividend checks to its preferred stockholders the middle of December instead of December 31, when due. The letter accompanying the dividend checks states that "the regularity with which these dividends have been paid for 30½ years has established an enviable reputation for this security as a local investment."

The letter explains, further, that with money available at lower interest rates and in view of the ever-increasing tax burden, the company has sought and secured permission from the state public utilities commission to reduce its dividend rate on preferred stock from 6 to 5 per cent. Stockholders have been advised, however, that arrangements have been made to underwrite any stock for those who prefer to receive cash in full.

The Athens Home Telephone Co. reports that it is operating more telephones than at any time in the past 35 years and that before the close of 1937 it had cut over to automatic operation the Plains and Chauncey exchanges, housed in a modern fireproof building in Chauncey.

▼ ▼

Ends Year with Small Station Loss

The Lincoln (Neb.) Telephone & Telegraph Co. closed 1937 with approximately 65,373 stations in operation, reports General Commercial Superintendent Herbert F. McCulla.

Up to the first of last August the Lincoln company was 697 telephones ahead of the figure for December 31, 1936, but the almost total loss of a corn crop in much of the area served forced many farmers to cancel service. Up till that time farm reconnections were showing a satisfactory gain.

By the middle of December the total gain had been changed into a loss, but active campaigning for new business resulted in reducing this to the point where the loss was 66 stations. Small town business men have responded well and show little, if any loss.

GLEAMS OF JOY

By MISS ANNE BARNES

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

THE CARTOONIST famous for his "After you, my dear Gaston" newspaper cartoons passed away recently. His comic-strip caricature of overdone politeness between two men made people laugh wherever newspapers were read in which the strip appeared. This artist had a keen sense of humor, and he made good use of it.

My observations of men and women on trains, in cafes, and other such public places have led me to believe that men, as a rule, enjoy reading the comic sections of the daily newspapers more than women. We all need a good hearty laugh as often as possible.

According to Addison: "Laughter, while it lasts, slackens and unbraces the mind, weakens the faculties, and causes a kind of remissness and dissolution in all the powers of the soul; and, thus far, it may be looked upon as a weakness in the composition of human nature. But if we consider the frequent reliefs we received from it and how often it breaks the gloom which is apt to depress the mind and dampen our spirits with transient, unexpected gleams of joy, one would take care not to grow too wise for so great a pleasure of life."

Abraham Lincoln once said that with the fearful strain he was under night and day, if he did not laugh sometimes, he would die.

We cannot all be cartoonists or possess the wit of radio comedians like Eddie Cantor, who build radio programs packed with fun to make us laugh. But, even as they do, we contact an invisible public through the medium of our voices. If we wish to render more than mechanical service we must cultivate the "voice-with-the-smile," which is only another way of saying: speak pleasantly, with proper accent, enunciation, and rhythm.

Every time we *serve* a customer with the voice-with-the-smile we contribute cheer to his fragment of life.

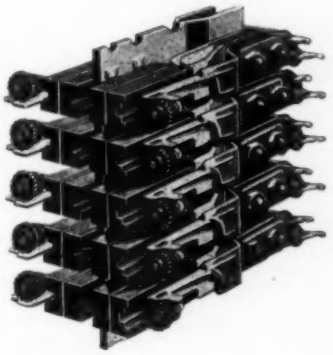
MORAL: The reason some of us do not reach the pleasant side of our customer's mind is because we stop on the threshold of his ear door and mumble or shout what we have to say to him.

YOU GET ALL THREE

✓ Positive Protection
✓ Excellent Performance
✓ Low Maintenance Cost

WITH COOK

The No. 100 Central Office Protector



A favorite with engineers because of its self-soldering heat coils, simple design and facilities for easy testing.

COOK ELECTRIC CO.
2700 Southport Ave. Chicago

Always Specify COOK PROTECTION

Commission and Court Activities

FCC Reports Salaries of Company Officials

The Federal Communications Commission reported December 27 that 500 executives of telephone and telegraph companies throughout the country received salaries of $10,000 or more per year, during 1936. There were 455 telephone and 45 telegraph executives. Compared with 1935 this was a decrease of 30 in both groups, the report showed. The report mentioned no names but gave the company names and the salaries paid presidents and other officials.

The data disclosed that 108 telephone and 22 telegraph officials in the category of $10,000 and over received increases of less than 10 per cent in 1936; that five telephone officials had raises of 10 per cent; that 63 telephone and two telegraph executives received from 10 to 20 per cent, and that 15 telephone and three telegraph men received increases exceeding 20 per cent.

The commission's report contained the following table showing the number of telephone and telegraph executives who received $10,000 or more, exclusive of "other compensation," in 1936:

Salary Group	Number of Persons. (1936) Telephone.	Telegraph.
$10,000-$12,499	196	16
12,500- 14,999	74	9
15,000- 17,499	74	6
17,500- 19,999	25	2
20,000- 22,499	18	4
22,500- 24,999	13	3
25,000- 27,499	13	..
27,500- 29,999	9	..
30,000- 32,499	5	2
32,500- 34,999	4	..
35,000- 37,499	3	..
37,500- 39,999	3	..
40,000- 42,499	8	1
45,000- 47,499	3	..
50,000- 52,499	1	..
55,000- 57,499	2	..
60,000- 62,499	..	1
62,500 and over	4	1
Total	455	45

TELEPHONY'S INDEX for Volume 113

which was completed with the December 25 issue, is now ready for distribution among those who keep complete files. In this index are listed the most important articles and items which appeared in TELEPHONY between July 3 and December 25, 1937. The index affords a ready reference and will be supplied free of charge to those making application. Write:

Telephony Publishing Corp.
608 S. Dearborn St.,
Chicago, Ill.

Valuation Case Remanded By U. S. Supreme Court

The long-expected ruling by the United States Supreme Court in appeal of the Pacific Gas & Electric Co. from an order of the California Railroad Commission, was made January 3. The court reversed a decree of a three-judge federal court in California which set aside an order of the railroad commission fixing rates on the historical cost basis for the Pacific Gas & Electric Co.

However, the court's opinion, written by Chief Justice Charles Evans Hughes, ordered a rehearing of this case for the purpose of determining the specific question of confiscation and indicated no approval of the historical cost doctrine as the only method of fixing utility rate bases.

Justice Black concurred only in the result of the reversal of the lower court's decree. Justice George Sutherland did not participate in the case at all.

Justice Pierce Butler delivered a vigorous dissenting opinion for himself and Justice James Clark McReynolds, holding that the majority opinion upset a long line of decisions in which it was decreed that reproduction costs must be considered in fixing the rate bases.

Chief Justice Hughes, however, contended the lower court had no right to enjoin the California commission's orders without any finding that the rates were confiscatory.

The litigation involved a 1933 order by the California Railroad Commission directing the Pacific Gas & Electric Co. to reduce its gas rates by $1,744,681 a year. Enforcement of the order was enjoined by the three-judge federal court on the ground that "proper evidence of the cost of reproduction had not been considered."

Overthrow of the reproduction cost and historical cost evaluation theories in favor of the prudent investment theory of evaluation has been advocated by President Roosevelt in conferences with utility leaders.

The reproduction cost rule was laid down by the United States Supreme Court in 1898, when it held estimates of the cost of reproducing utilities properties at current price levels must be weighed in evaluating utilities properties for rate-making purposes. It has been reaffirmed by the high tribunal on several subsequent occasions.

The opinion delivered by Chief Justice Hughes made it clear the court will embrace no arbitrary rule of thumb, whether it be the President's prudent investment theory or the reproduction cost method favored by the utilities. The opinion indicated that the court will determine each case on its merits. In reversing the Pacific Gas & Electric case the opinion said:

"The main issue in this litigation is whether the rates as fixed by the commission's order are confiscatory. The district court did not determine that issue. The district court should determine it. The decree is reversed and the cause is remanded for further proceedings in conformity with this opinion."

Illinois Bell Awarded Unclaimed Refunds

The Illinois Bell Telephone Co. on December 23 was awarded $1,503,000 remaining from the refunding of $18,897,980 ordered by the United States Supreme Court for the benefit of subscribers who paid overcharges on certain coin-box services for a period of 11 years.

Overruling the claims of the state, city, county, and attorneys for individual subscribers, a statutory federal court declared that the company was entitled to the residue. The court was comprised of Judge Evan A. Evans, senior judge of the United States Circuit Court of Appeals, and Judge James H. Wilkerson, senior on the United States District Court bench.

The company, the court declared,

had spent $3,000,000 of its own money in promptly making a canvass on 900 million items of overcharges. Secondly, an estimated one-third of the 300,000 subscribers who did not apply for refunds were persons who owed the company money for service, the court said.

By the order the company will pay the Illinois Commerce Commission $60,000 and expenses incurred by the commission in connection with the refund, and $37,000 to J. G. Wray & Co., special consulting engineers for the city in the case. The city financed ten years of litigation which ended with the ruling in 1934 by the high court that excess collections must be refunded.

Of the $18,897,980 available for refund, approximately $15,000,000 was returned to 1,495,974 individual subscribers, and part of the balance went for attorneys' fees and expenses, including most of those incurred by the city of Chicago.

Aside from those debtors entitled to refunds, there were an estimated 100,000 subscribers whose claims would have been for less than $2 each, and another large group unwilling to identify itself. This group supposedly is comprised of racing bookmakers and disorderly house operators.

Those who received refunds were persons who had two or four-party residence coin-box service and single or two-party business coin-box service at any time during the period 1923-1934. The amount was approximately 15 per cent of their payments during that period. Public pay stations were not affected by the ruling.

Judges Evans and Wilkerson gave full credit for the victory of the subscribers to attorneys Benjamin F. Goldstein and George I. Haight, who were awarded a fee of $1,552,500 for their services in 1934.

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Tentative Findings Soon in Wisconsin Bell Case

Tentative findings in the Wisconsin Telephone Co. case will be ready January 16 or January 20, Circuit Judge A. C. Hoppmann said December 29, in Madison, as explanatory arguments on the company's appeal from three rate reduction orders of the Wisconsin Public Service Commission were concluded.

When the judge reaches conclusions on certain points in the case he wants counsel for both the commission and the company to be present and assist him, he said.

"I haven't made up my mind on many of these questions," he said. "When I come to conclusions on those questions I will want further advice and assistance."

"I'm not going to waste two months' time and then not have something for the supreme court," he added.

Before he took all new points made and old ones reaffirmed under further study, Judge Hoppmann commended the attorneys for their "exposition," and added, with a smile, "If a court does not understand it, it's the court's fault."

For the last two months Judge Hoppmann has been studying the voluminous records in the case, including a 25,000 page commission record, of its five-year investigation.

Last week for almost three days he listened to further arguments by Harold M. Wilkie, special counsel for the commission, and Frederic Sammond, Milwaukee, company attorney, for and against the commission's orders.

The orders would cut depreciation rates $700,000, reduce subscriber rates $863,000 a year permanently and would provide a $1,701,000 refund to customers on rates paid from August 5, 1934, to August 4, 1935.

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Handset Charge Reduced By Bell in Iowa

A reduction in the charge for hand set telephones was announced December 18 by the Northwestern Bell Telephone Co., applicable to all of its exchanges in Iowa. The rate of 15 cents a month for 36 months is being reduced to 10 cents a month for 18 months, effective on December billings.

If a subscriber is paying for a handset, and has not completed 18 payments, the remaining months up to 18 will be billed at only 10 cents a month instead of 15 cents, it was reported. If 18 full monthly payments have been made, the charge is to be discontinued.

In connection with the reduced rates, a wall or desk telephone may be changed to a hand telephone at the reduced rate plus a charge of $1 for making the change. When more than one telephone is changed at the same time, the change charge per telephone is lower.

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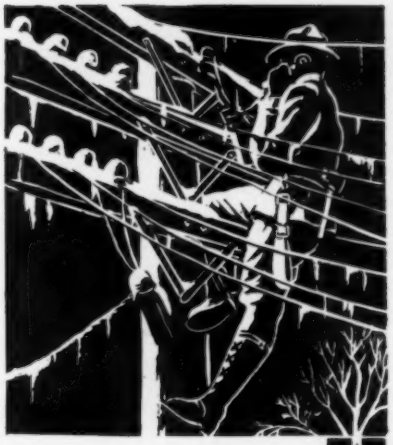
Telegraph Companies Seek Rate Increases

The leading telegraph companies throughout the United States filed a joint petition with the Federal Communications Commission December 22 requesting a 15 per cent increase in domestc rates, covering both residential and commercial services. Cable, press and holiday greeting rates are not included in the application.

This is the first time in 30 years, with the exception of the period during the World War when the government operated the telegraph industry,



"Say, Bill—If these drop wires we put in last spring had only been Ironite, instead of that cheap imitation stuff, we wouldn't be doin' all this replacing this icy weather! For Ironite's so strong — like steel, nearly — it'll carry most any load of ice without breakin'. And it's so easy to work with too — ties tight, and splices firm as a weld."

Yes, IRONITE—Genuine Ironite—is nearly as strong as steel—the pure iron conductors, zinc coated by the noted "Crapo" process are not only strong (breaking strength, No. 18—170 pounds)—but, a drop wire length has a conductivity equivalent to No. 22 copper. Signals come thru clear and free of distortion.

And when price comparisons are made—well, Genuine IRONITE shows such marked economies, with its long life and high quality that there *just is no comparison*—Ironite shows savings of up to 20% over copper clad or bronze.

Note these points—

Wind swaying does not crystallize IRONITE.

Ice and sleet do not break IRONITE.

Heat or cold—sand or sleet have little effect on the insulation of IRONITE.

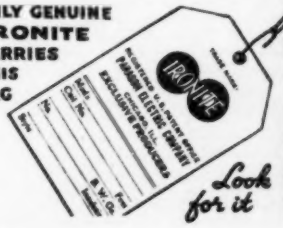
It is difficult to beat IRONITE Prices—

It is impossible to beat IRONITE quality.

Write for latest quantity price quotations on genuine IRONITE

PARAGON ELECTRIC CO.
37 West Van Buren St., CHICAGO

ONLY GENUINE IRONITE CARRIES THIS TAG



that such action has been taken by the communications industry.

In doing this the companies, officials of the commission stated, departed from their regular practice as provided for in the law. They made it clear, however, that there was nothing illegal or improper about the petition, although it was unusual.

Hitherto, whenever these companies sought increases or changes in rates, they followed the established practice of filing notice of tariffs that they expected to charge. If the commission disapproved these tariffs, it would merely issue an order of suspension pending hearings and a decision. In the present petition the companies have filed no schedule of tariffs but merely a request that the increase be granted.

The Western Union Telegraph Co., the Postal Telegraph & Cable Corp. and the Mackay Radio & Telegraph Co. issued a joint statement December 21 revealing their plans.

In making the application, the companies pointed out that despite drastic economies effected in operations during the last few years the financial resources and credit of the companies are being jeopardized by the decline in revenues brought on by the general slackening of business throughout the country.

The heavy burden of taxation imposed on the companies, particularly in the form of Social Security and other taxes, according to the statement, has added substantial amounts to the constantly-growing costs of telegraph operation and has served to make the situation more critical. Wage restorations and increases are also cited as bearing heavily on the situation.

"In making this application," the statement pointed out, "one of the oldest public service institutions in the nation is obliged to break a precedent of 30 years' standing. The position of the telegraph industry in the public service is unique in that it does not assess a stand-by charge, but must rely for its income wholly on what is paid for each item of service performed.

"By progressive methods and a continued series of improvements and new developments in plants and operating processes, it has not only met all the increasing costs arising during the past three decades, but has actually decreased the cost of its service to the public."

Operating figures and financial statements for the first ten months of the current year are cited in the petition, tending to show that, while gross revenues of the company have continued upward or at least held steady, net income has been constantly declining and that the companies are now operating either at a deficit or on a slender margin of profit.

This, it is held, will shortly impair the ability of the companies to continue rendering efficient service.

CABLE—LEAD ENCASED

Kennecott Wire and Cable Company, Subsidiary of Kennecott Copper Corporation, Phillipsdale, R. I.—Paper telephone cable, switchboard cable, bare copper wire. Chicago: 140 South Dearborn Street; Cincinnati: Traction Building; New York: 10 East 40th Street.

POLES

B. J. Carney & Co., 100 N. 7th St., Minneapolis, Minn.—Western red cedar poles. Pentrex Butt Treated or Plain.

International Creosoting and Construction Co., Galveston, Texas.—Creosoted Southern Yellow Pine Poles. Plants: Beaumont and Texarkana, Texas.

MacGillis & Gibbs Company, Milwaukee, Wis.—Northern White and Western Red Cedar Poles. Plain or butt-treated. Immediate quotations on request.

T. M. Partridge Lumber Co., Minneapolis, Minn.—Northern White—Western Red Cedar Poles. Plain or butt-treated.

H. Sigalet & Company, Ltd., Lumby, B. C., Canada—Western Red Cedar Poles. Plain or butt-treated.

Valentine Clark Corporation, 2516 Doswell Ave., St. Paul, Minn.—Finished Cedar Poles. Plain or butt-treated.

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Company Authorized To Issue 5 Per Cent Notes

The Cornwall Telephone Co. has been authorized by the New York Public Service Commission to issue within a period not later than January 31, 1938, a note or notes of a face amount or aggregate face amount of not to exceed $45,000 to mature on January 1, 1941, to bear interest at a rate of 5 per cent per annum and to be redeemable at the option of the company at any time at par and accrued interest.

The note or notes are to be sold to Central Hudson Gas & Electric Corp., which owns and holds all the outstanding stock of the Cornwall Telephone Co., at not less than par and accrued interest to realize proceeds of not less than $45,000, and to apply the proceeds to the payment and discharge of not less than $45,000 aggregate face amount of short term 5 per cent notes or bills payable. The company operates a telephone system in the village of Cornwall and in the towns of Cornwall and New Windsor in Orange County.

A report approved by the commission states that while it appears that the acquisition of the telephone company's stock by the Central Hudson company was had through operation of law, having been effected through the merger of a corporation which had acquired that stock prior to the effective date of the public service law, "the holding of that stock and the resultant control over the telephone operations of the servient company by a gas and electric corporation is not in the public interest."

The report adds that "the Central Hudson can best serve the public by limiting its efforts to efficiently distributing at reasonable rates the products or services for which it was incorporated." The holding company should take under advisement means of divesting itself of ownership and interest in the stock and operations of this company, says the report approved by the commission.

The company petitioned for authority to issue $60,826 aggregate face amount of unsecured 5 per cent notes to be sold to Central Hudson Gas & Electric Corp. and to apply $55,509.77 of reimbursement moneys to the discharge or refunding of notes and accounts payable to Central Hudson and $5,316.23 to reimburse the treasury for moneys expended from income for capital purposes as of March 31, 1935.

The commission points out that securities may not be issued solely on the basis of increase in fixed capital and states that increases to depreciation reserve and increase in outstanding capital stock must be considered and concludes that the findings warrant authorization to issue not to exceed $45,000 face amount of notes.

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Order Fixing Temporary Rates, Held Invalid

The United States district court in Pennsylvania granted an injunction,

October 15, restraining the enforcement of an order of the Pennsylvania Public Utility Commission, fixing temporary rates for electricity pending final determination of the rate proceeding pursuant to provisions of the state public utility law. The suit was brought in statutory court by the Edison Light & Power Co. vs. Driscoll et al., individuals constituting the Pennsylvania commission.

The order was found invalid by the court because of the failure of the commission to make findings and state elements of value upon which temporary rates were fixed. One of the three judges in the statutory court held unconstitutional the statute which empowers the commission, pending final determination of a case, to provide rates sufficient to provide a return of not less than 5 per cent upon the original cost less accrued depreciation and requiring the commission, in fixing permanent rates, to permit recovery by the utility of any losses under temporary rates. The other two judges, in a separate opinion, hold the statute to be constitutional.

As to the failure of the commission to make findings of value in its order of July 27, District Judge Johnson said:

"The order does not state any element of fair value on which the temporary rates were fixed. A reviewing court is, therefore, unable to determine from the order whether any elements, and if any what elements, of fair value were considered as required by the statute."

District Judge Watson, after holding the statute to be constitutional, said:

"Clearly it was the duty of the commission to make findings of fact as to the basis upon which the rate reduction was ordered and, not having done so, its action was arbitrary and violates the due process clause of the 14th amendment of the Federal Constitution.

In fixing temporary rates the commission should, in my opinion, consider those elements which the Supreme Court has said must be considered in fixing a fair rate. Smyth v. Ames, 169 U. S. 466, 546; Des Moines Gas Co. v. Des Moines, 238 U. S. 153, 165. These need not be considered with the same care, particularity and thoroughness with which they must be considered in fixing final rates, but they must be considered to such an extent that confiscatory temporary rates will be avoided. In most cases and certainly in this case such a requirement will not place any extra burden upon the commission and should not cause any unreasonable delay."

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Summary of Commission Rulings and Hearings

Federal Communications Commission, Washington, D. C.

December 23: Order issued approving an examiner's report classifying the Barron County Telephone Co., Rice Lake, Wis., as a connecting carrier and subject to Sections 201-205, only, of the Communications Act of 1934. The commission found that the company is controlled by the General Telephone System rather than by the Wisconsin Telephone Co. as originally alleged.

December 23: Commissioner Case authorized that the petition of the Crown Point Telephone Co. to purchase the Northwestern Indiana Telephone Co. be withdrawn, in view of the fact that the latter has been acquired by the Indiana Associated Telephone Corp., a subsidiary of the General Telephone System. The Crown Point company is controlled by the Illinois Bell Telephone Co.

December 28: Order issued granting the Pacific Telephone & Telegraph Co., of San Francisco, Calif., temporary authority to use coastal harbor stations KOW and KLH as point-to-point stations pending repair of telephone line facilities between Portland, Ore., and Seattle, Wash., which were put out of commission by heavy snows.

January 10: Hearing before an examiner on application of the Lorain County Radio Corp. for authority to establish new Great Lakes radiotelephone stations at Port Washington, Wis., and Duluth, Minn.

January 12: Hearing before an examiner to determine whether the FCC has jurisdiction over the Norfolk & Carolina Telephone & Telegraph Co.

January 26: Hearing before an examiner on application of the Nebraska Continental Telephone Co. to purchase the assets of the Nebraska Continental Telephone Corp.

March 2: Hearing before an examiner on application of the Indiana Bell Telephone Co. for approval of purchase of the Dugger Mutual Telephone Co.

Illinois Commerce Commission

December 29: Order issued authorizing the Illinois Bell Telephone Co. to make loans up to $1,000 to employes from a revolving fund not to exceed $30,000. The loans will be interest free and repayable in installments.

January 4: Hearing in Springfield on

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